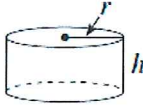
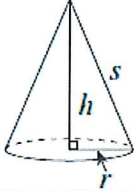
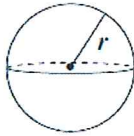


3.3 Surface Areas of Cylinders, Cones and Spheres

It is more difficult to find the areas of the faces of cylinders, cones and spheres, so you will be given these formulas:

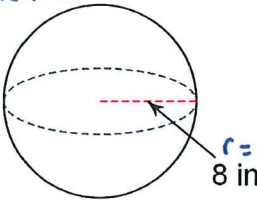
3D Figure	Surface Area
<p>Cylinder</p> 	$SA = 2\pi r^2 + 2\pi rh$ <i>area of two circles</i> <i>wrap around rectangle</i>
<p>Cone</p> 	$SA = \pi r^2 + \pi rs$ <i>area of a circle.</i>
<p>Sphere</p> 	$SA = 4\pi r^2$

Use the pi (π) button on your calculator. If you don't have one, you can use the approximation $\pi \cong 3.14$, but your answers may be off slightly from the given correct answers.

Examples

Ex 1. Find the surface area of each of the following. Round to the nearest hundredth.

a) *sphere*



$r = 8 \text{ in}$

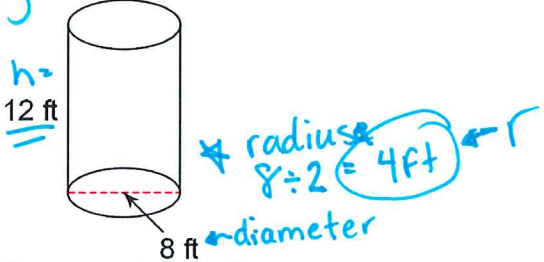
$$SA = 4\pi r^2$$

$$= 4 \times \pi \times (8)^2$$

$$= 4 \times \pi \times 64$$

$$= 804.25 \text{ in}^2$$

b) *cylinder*



$h = 12 \text{ ft}$

$8 \div 2 = 4 \text{ ft}$ ← radius

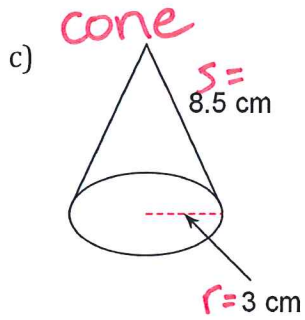
8 ft ← diameter

$$SA = 2\pi r^2 + 2\pi rh$$

$$= \underbrace{2 \times \pi \times (4)^2}_{\textcircled{1}} + \underbrace{2 \times \pi \times 4 \times 12}_{\textcircled{2}}$$

$$= 100.5309 \dots + 301.5928 \dots$$

$$= 402.12 \text{ ft}^2$$



$$\begin{aligned} SA &= \pi r^2 + \pi r s \\ &= \pi \times (3)^2 + \pi \times 3 \times 8.5 \\ &= 28.274 \dots + 80.110 \dots \\ &= 108.38 \text{ cm}^2 \end{aligned}$$

3.3 Practice

1. Find each surface area. Round to the nearest hundredth.

